DigiTrak®

Series Display

AURORA™

Operator's Manual

Panel Mounted AP8

Freestanding AF10

DCI® Digital Control Incorporated

dci@digital-control.com

www.DigiTrak.com

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Contact Us

United States *DCI Headquarters*	19625 62nd Ave S, Suite B103 Kent Washington 98032, USA +1.425.251.0559 / 1.800.288.3610 +1.425.251.0702 fax dci@digital-control.com
Australia	2/9 Frinton Street Southport QLD 4215 +61.7.5531.4283 +61.7.5531.2617 fax dci.australia@digital-control.com
China	368 Xingle Road Huacao Town Minhang District Shanghai 201107, P.R.C. +86.21.6432.5186 +86.21.6432.5187 fax dci.china@digital-control.com
Europe	Brueckenstraße 2 97828 Marktheidenfeld Germany +49.9391.810.6100 +49.9391.810.6109 fax dci.europe@digital-control.com
India	DTJ 1023, 10th Floor DLF Tower A, DA District Center Jasola, New Delhi 110044 +91.11.4507.0444 +91.11.4507.0440 fax dci.india@digital-control.com
Russia	Molodogvardeyskaya Street, 4 Building 1, Office 5 Moscow, Russia 121467 +7.499.281.8177 +7.499.281.8166 fax dci.russia@digital-control.com

See our DigiTrak Training Videos on YouTube at www.youtube.com/dcikent.

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LIMITED WARRANTY

Notice Product drawings in this document contain distinctly different colors to help the reader distinguish components. These colors are for illustration purposes only and do not represent actual product colors.

Important Safety Instructions

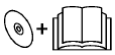
Warning

All operators must read and understand the following safety precautions and warnings and must review this operator's manual and the operator's manual for their DigiTrak locating system before using the Aurora display. If you have any questions about the operation of Aurora, please contact DCI Customer Service for assistance.

General

The following warnings relate generally to the operation of DigiTrak locating systems. This is not an exhaustive list. Please review the operator's manual for your DigiTrak locating system for additional safety precautions and warnings relating to its use.

Serious injury and death can result if underground drilling equipment makes contact with an underground utility such as a high-voltage electrical cable or a natural gas line. DigiTrak locating systems *cannot* be used to locate underground utilities.



Work slowdowns and cost overruns can occur if drilling operators do not use the drilling or locating equipment correctly to obtain proper performance.

Substantial property damage and liability can result if underground drilling equipment makes contact with an underground utility such as a telephone, cable TV, fiber-optic, water, or sewer line.

This symbol on equipment indicates that the equipment must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of such equipment at a designated collection point for the recyclzing of electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help conserve natural resources and ensure it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service, or the shop where you purchased the equipment.

Aurora

Aurora is for use solely with DigiTrak Horizontal Directional Drilling Locating Systems. The warnings in this section relate specifically to the operation of an Aurora display with DigiTrak locating systems.

The Aurora display does not eliminate the need for human judgment by a drill rig operator. Danger may arise at the job site at any time even without an alarm or warning from the Aurora display. Drill rig operators must maintain close attention to the drilling operation at all times.

Do not view training videos or help files on Aurora while drilling.

DCI does not warrant or guarantee the accuracy of data or information displayed or generated by Aurora. The accuracy of such data or information may rely on the accuracy of input from third-party sources, such as drill rigs or other equipment manufactured by third

parties, GPS data, or bore plan or other data input by a user. DCI cannot be responsible for the accuracy of such third-party input.

Interference may result in interruption of the flow of data between Aurora and a DigiTrak receiver. Possible sources of interference include (but are not limited to) other horizontal directional drilling equipment, handheld radios, or any other source of noise or signal at the same frequency as the telemetry signal received or transmitted by Aurora.

The accuracy of data generated by a DigiTrak Locating System may be affected by a variety of factors, including (but not limited to) interference (passive or active) or other environmental conditions, improper use of the DigiTrak locating system by the end user, failure to follow instructions found in the operator's manual for the DigiTrak locating system, and failure to properly calibrate the DigiTrak Locating System. Always perform a background noise check prior to drilling.

Aurora transmits radio signals. Accordingly, maintain a minimum distance of 8 in. (20 cm) between the user's torso and the Aurora display during operation.

Because this equipment may generate radio frequency energy, there is no guarantee that interference will not occur at a particular location. If this equipment does interfere with radio or television reception, which can be determined by powering the equipment off and on, try to correct the interference using one or more of the following measures:

- Reorient or relocate the Aurora antenna.
- Increase the separation between the Aurora and the affected equipment.
- Consult the dealer or DCI Customer Service for help.

In the event of electrostatic shock, the touchscreen may act as if it has been touched. No data loss will occur but windows may open or close randomly. User intervention is required to return the screen to the previous state.

An Aurora display is GPS-ready. Review local regulations governing the use of GPS before using any applications that employ this technology.

Failure to properly care for and maintain your Aurora display may result in malfunction or inoperability of the unit. If your Aurora malfunctions or ceases to operate for any reason, stop drilling immediately and contact DCI Customer Service.

An Aurora display contains no user serviceable parts. Contact your local HDD dealer or DCI customer service if you believe service is required.

Care and Maintenance

Touchscreen Interface

Avoid operating Aurora while wearing gloves not specifically designed for use with touchscreens, as the response will be poor and foreign material on the gloves may damage the touchscreen. Use the soft pad of your fingertip to tap the display, or use gloves with a touchscreen-compatible fingertip. Never use a fingernail or foreign object.

Cleaning

Clean the glass screen on the display using the materials in the cleaning kit provided with your locating system. The included glass cleaner is specifically tested to not harm the protective coatings on the glass. Use the power button to lock the screen for cleaning (see Power On, page 11).

If the included cleaner is unavailable, use a non-abrasive soap and water mixture on the display and case.

Wipe the screen gently with a microfiber or soft cotton cloth, as hard rubbing may remove or damage the anti-reflective coating. Avoid salt water, which is abrasive.

Do not use household or commercial window cleaning products that include chemicals such as ammonia, alcohol, or any acidic liquid. These cleaners can contain microscopic abrasive granules that will damage the anti-reflective film and may cause the display to spot.

Use all provided connector covers when connectors are not in use. Ensure connectors are free of debris before making connections.

The Aurora is IP66-rated to be resistant to water jets with pressure up to 14.5 psi (100 kPa) at a distance of 10 ft (3 m). Avoid using pressure washers or steam cleaners that exceed this level.

Heat and Sunlight

It is normal for the display to get warm. The housing functions as a cooling surface that transfers heat from the inside. In hot environments, you can help your Aurora stay cool by providing shade and/or lowering the touchscreen brightness.

In extreme heat and direct sunlight conditions, the maximum internal operating temperature of the Aurora unit may be exceeded. One of the first symptoms of overheating is an unresponsive touchscreen. To restore functionality in this case, shade the display from direct sunlight, turn down the screen brightness, and allow it to cool. If possible, turn the display completely off using the power button or by removing power from the display. After sufficient cooling time, full functionality will return.

If Aurora senses it is overheating, it will slow processing tasks to minimize heat and protect internal components. If overheating continues, it will shut down before any damage can occur. If this happens, stop drilling immediately, keep the Aurora off and in shade, and allow fifteen minutes for it to cool before restarting.

If excessive heat causes the touch function to become unresponsive, you can still use a USB mouse to make selections, such as accessing the Settings window to lower the screen brightness.

General

Turn off the display when not in use.

Store the display in its case, away from extremes of heat, cold, and moisture. Test to confirm proper operation prior to use.

Inspect the display daily and contact DCI if you see any damage or problems. Do not disassemble or attempt to repair.

Introduction

Aurora DigiTrak Series Display, Panel Mounted AP8 and Freestanding AF10

The Aurora™ DigiTrak® Series Display is a multifunction touchscreen device that works with most DigiTrak locating receivers. A receiver (locator) is used during horizontal directional drilling operations to locate and track a transmitter installed in the drill head. Aurora provides the drill rig operator information from the receiver about the depth, orientation, and status of the transmitter. In addition, Aurora's multi-tasking abilities let it (for example) simultaneously track and graph fluid pressure and monitor target steering.

Aurora is powered through the drill rig's DC power supply. The supplied external 13 in. (33 cm) telemetry antenna enhances signal reception up to 1800 ft (550 m) with line of sight to the receiver.

A complete system consists of an Aurora display, a handheld receiver (locator), a transmitter, power cable, a battery charger system, and two rechargeable lithium-ion (Li-ion) battery packs for powering the receiver. Depending on how you purchased your Aurora, you may not have received all of these components.

This manual discusses only operation of the Aurora display. For additional information on other components of a DigiTrak locating system, such as the receiver, transmitters, or battery charger, as well as helpful information on drilling and locating, please see the corresponding DigiTrak Operator's Manual, available at www.DigiTrak.com.

This manual assumes the receiver is an F5. When using the Aurora with other DigiTrak receivers, such as SE® or F2®, small differences in screen elements or behavior will exist, but the primary functionality remains the same, within the capabilities of your receiver.

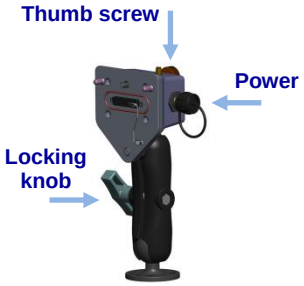
Getting Started

Following are the basic steps for setting up your Aurora display for drilling. For complete details on the safe setup, operation, and features of your Aurora, please review the rest of this manual.

Keep the separate Quick Start Guide (QSG) that came with your Aurora with you while you drill. The QSG is also available on your Aurora through the Help menu.

Don't forget to register your Aurora at access.DigiTrak.com.

Freestanding AF10

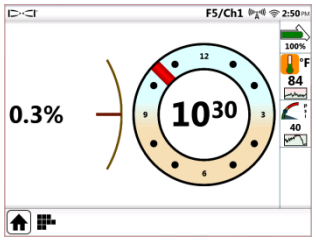


1. Install the docking station in a solid location and tighten the locking knob firmly.
2. Connect the round keyed connector on the power cable to the docking station and the other end to a 12–24V accessory port.
3. Connect your Aurora to the docking station using the thumb screw on the back.

Continue below.

All Models

1. Connect the telemetry antenna.
2. Connect Aurora to a power source; it displays the **Home** screen.
3. Tap **Main Menu**, then **Receiver** to select your type of receiver, telemetry channel to match that of the receiver, and region.
4. Tap **Home** to return to the Home screen. If the receiver is receiving data from a transmitter, that data will now display on the Aurora.



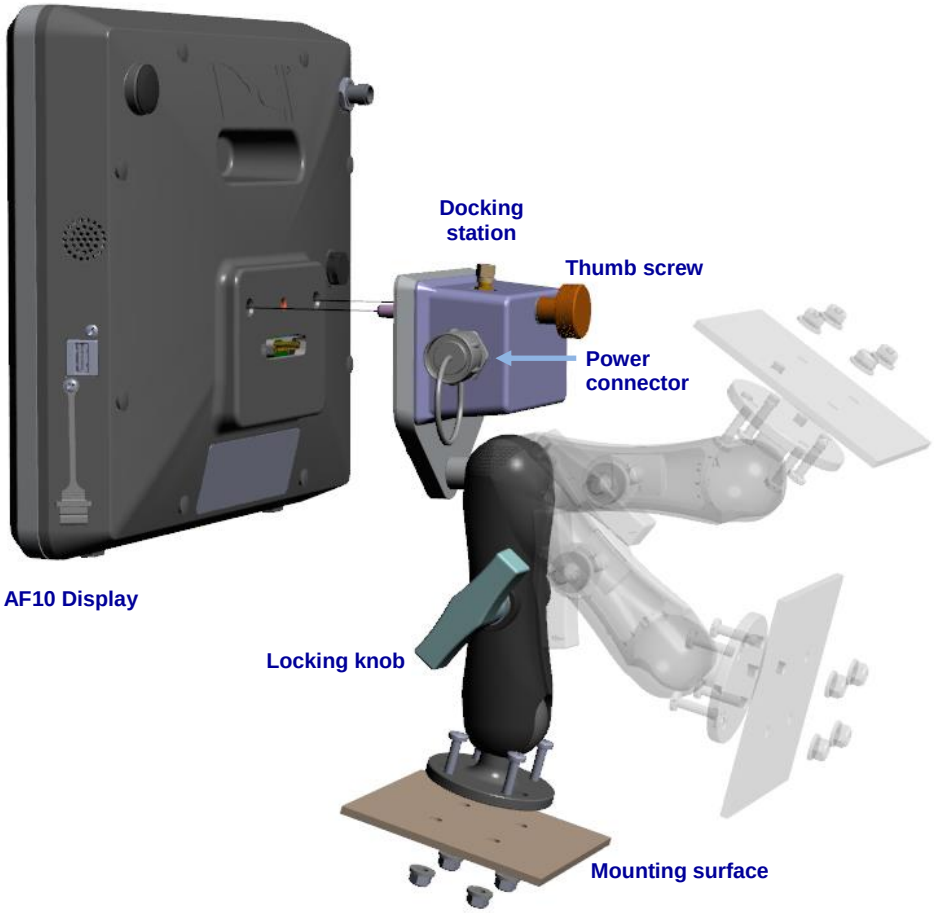
For more information on Settings, see page 14.

Aurora Panel Mounted AP8

Installing Your Display

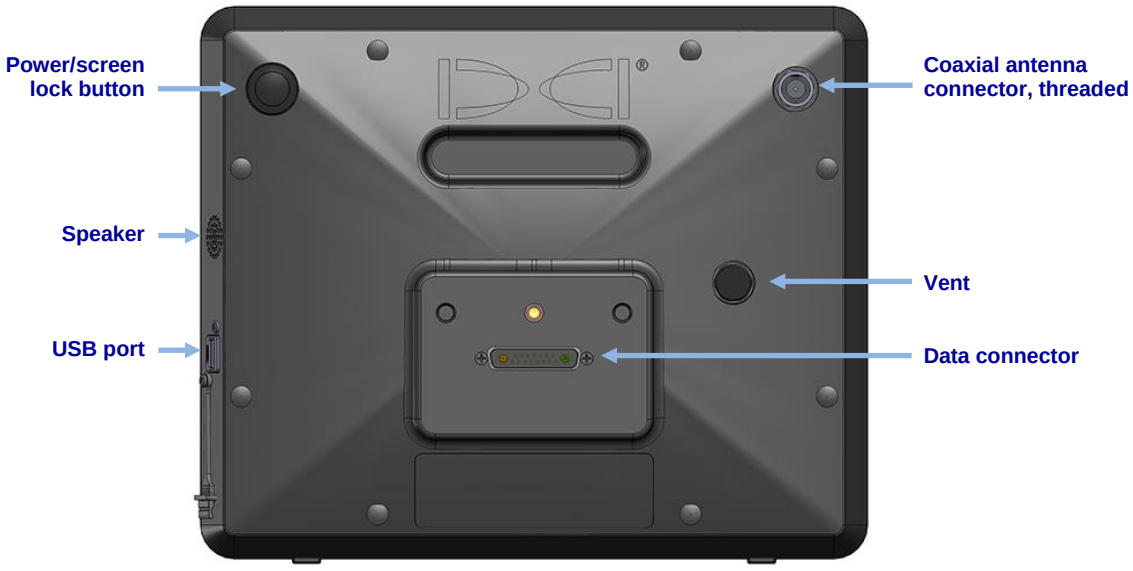
An 8 in. panel mounted Aurora (model AP8) should be installed by your DigiTrak dealer. To install the AP8 yourself, refer to the MFD/ Aurora Installation Guide, available at http://www.DigiTrak.com/. After your panel mounted Aurora is installed, skip to Main Menu on page 11.

This section discusses installation of the freestanding model AF10, shown below.



AF10 Exploded View

Back Panel



AF10 Rear Panel

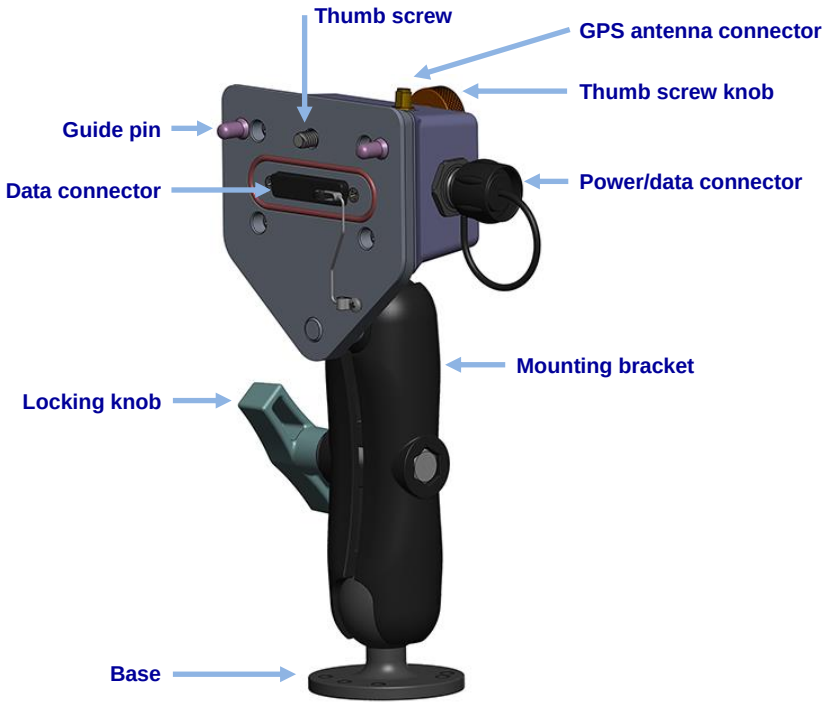
Drill Docking Station

Danger Mount the docking station (a) to a surface that can easily support the weight of the entire display, (b) where it will not impair the operator's normal range of motion, (c) where it can be readily accessed by the operator, and (d) where it does not in any way interfere with existing systems on the drilling platform.

Do not (a) wire the Aurora directly to non-switched power (battery drain will occur when the drill rig is off), (b) route wires where they will rub or receive unnecessary wear, (c) leave inadequate play in wires that restricts movement of the display, or (d) place strain on wiring connectors.

The Aurora AF10 display quick-connect drill docking station is for installation on your drill rig. Once installed, the docking station base should remain on the drill rig at all times. To remove the bracket from the base, loosen the locking knob.

Select a flat horizontal location that puts the Aurora within easy reach yet does not infringe on the operator's normal range of motion. The location must also allow a clear line of sight to the receiver and access for required cabling.



AF10 Drill Docking Station

Secure the docking station to a flat surface on the drill rig with the fasteners provided in the hardware kit. DCI recommends bolting the docking station only to a strong metallic surface; flexible material such as plastic or fiberglass may appear rigid, but can flex and crack over time, even with reinforcement at the mounting holes.

This docking station is not intended for wall mounting.

Notice Do not loosen the docking station locking knob without first supporting the display or it may tip over and impact the mounting surface. Always tighten the locking knob before mounting the display.

Attaching the Aurora

Align the guide pins on the mobile or drill docking station with the identical receptacles on the back of the Aurora. While holding the Aurora firmly against the bracket, turn the thumb screw clockwise until tight to secure the Aurora to the docking station.

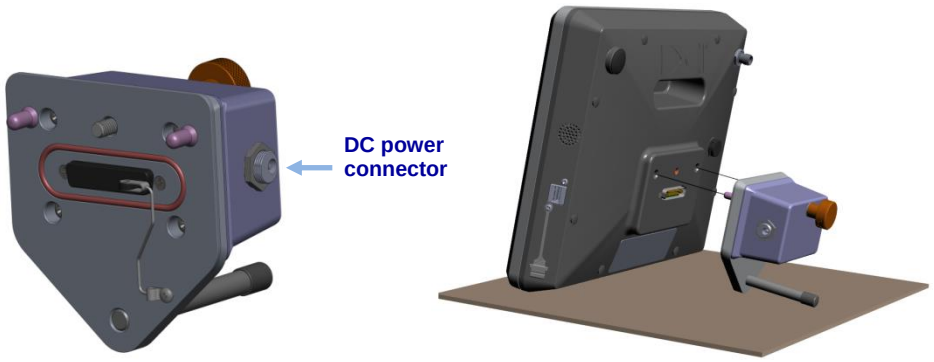
Remove the Aurora from the docking station and store it safely during equipment transport; use the included rubber cap to protect the data connector when the Aurora is not connected.

Adjusting the Viewing Angle

To adjust the viewing angle, hold the display firmly with one hand, then loosen the locking knob slightly with your other hand, adjust the screen, and retighten firmly. If the locking knob is not tightened firmly, the display may not hold its position during drilling.

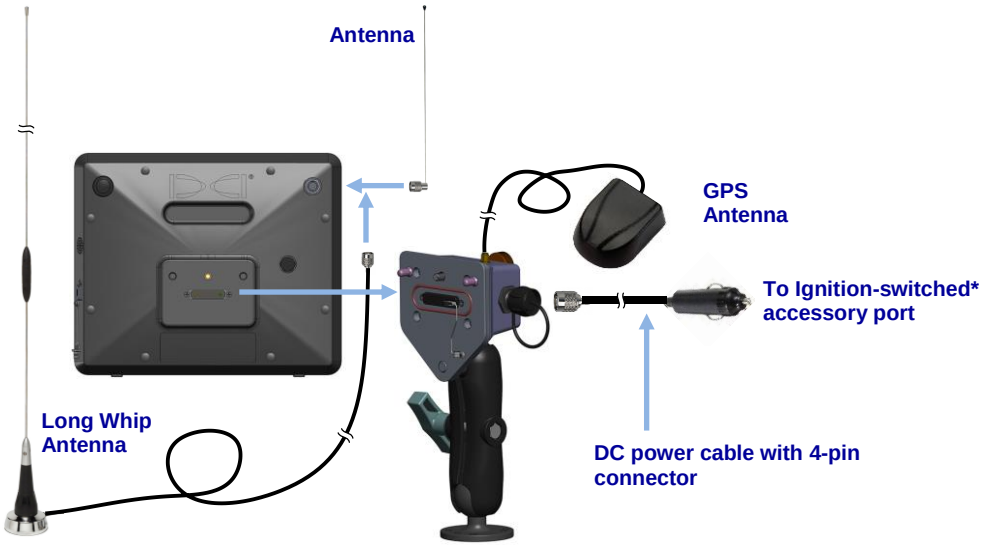
Mobile Docking Station

Your Aurora includes a mobile docking station and power supply for using the display while away from the drill rig.



AF10 Mobile Docking Station

Connections



* Recommended

Wiring Connections (Optional Long Whip Antenna Also Shown)

DC Power Cable

The DC power port on the display mount uses a cable with a round 4-pin connector. To connect the cable:

1. Remove the protective cap from the round power/data connector on the mounting bracket by rotating it counterclockwise.
2. The DC cable connector and power port are keyed to ensure proper alignment. Rotate the connector until the slots line up, then push the connector in and rotate clockwise a quarter turn to lock it.
3. Plug the other end of the DC cable into a 12 VDC accessory port. The accessory port should not be powered when the ignition is off because Aurora always draws current when connected to a power source, even when it appears off.

   If you choose to remove the 12V accessory plug and wire the power cable directly to a DC power source, connect the white wire to a positive voltage terminal and the black wire to ground.

Telemetry Antenna

Connect the whip antenna to the coaxial connector on the back of the Aurora. If you are using the optional Long Whip Antenna for extended range, refer to the separate instruction sheet for important installation and safety information.

GPS Antenna

Plug the GPS antenna cable into the connector on the Drill Docking Station shown on page 8. Identify an open horizontal installation area with a clear view of the sky. Clean the installation area thoroughly and allow to dry completely before peeling the backing from the double-sided tape on the antenna and pressing it into place. Route and secure the cable safely.

The GPS in Aurora sets the system date and time and will be used in future applications. The GPS is not used with the mobile docking station.

GPS Antenna

Multi-Function Cable Box

A Multi-Function Cable Box (MFCB) is required when drilling with a Steering Tool (SST®) or cable transmitter. For details on connecting the MFCB, refer to the MFCB Operator's Manual, available at www.DigiTrak.com. For more information on using Aurora with these transmitters, please see Working with the MFCB on page 34.

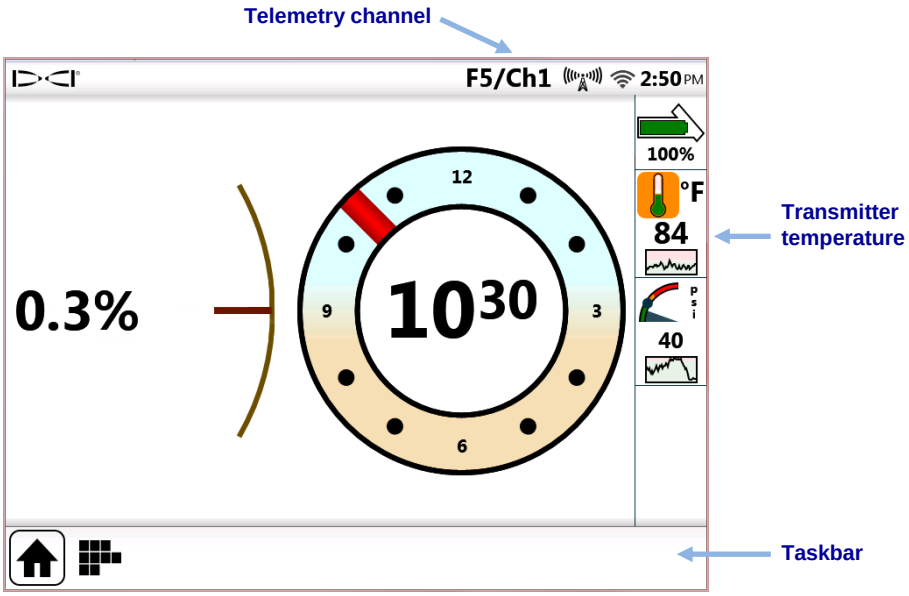
Main Menu

Power On

Aurora automatically turns on and displays the Home screen when it receives power.

To temporarily lock the screen so you can wipe it clean without making selections, press and release the power button. A padlock displays beside the DCI logo in the upper left of the screen to indicate the screen is locked. Press and release the power button again to unlock the screen.

To put the Aurora into a low-power state with the screen off and processor halted, hold the power button in for approximately two seconds. Press and release the power button again to resume.



Home Screen

The Aurora touchscreen features a taskbar at the bottom and shortcuts directly to key features. For example, to change the telemetry channel, simply tap and hold the telemetry channel label at the top of the screen (here **Ch1**) and Aurora opens the appropriate Settings window in the **Main Menu** . Similarly, to view temperature alarms, tap and hold on the transmitter temperature icon °F.

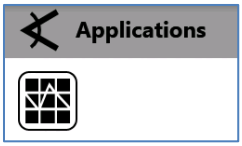
Use the soft pad of your fingertip to tap the display, or use gloves with a touchscreen-compatible fingertip. Never use a fingernail or foreign object.

The **Main Menu** is divided into three sections:

- Applications (next section)
- Settings (page 14)
- Help (page 23)

Applications

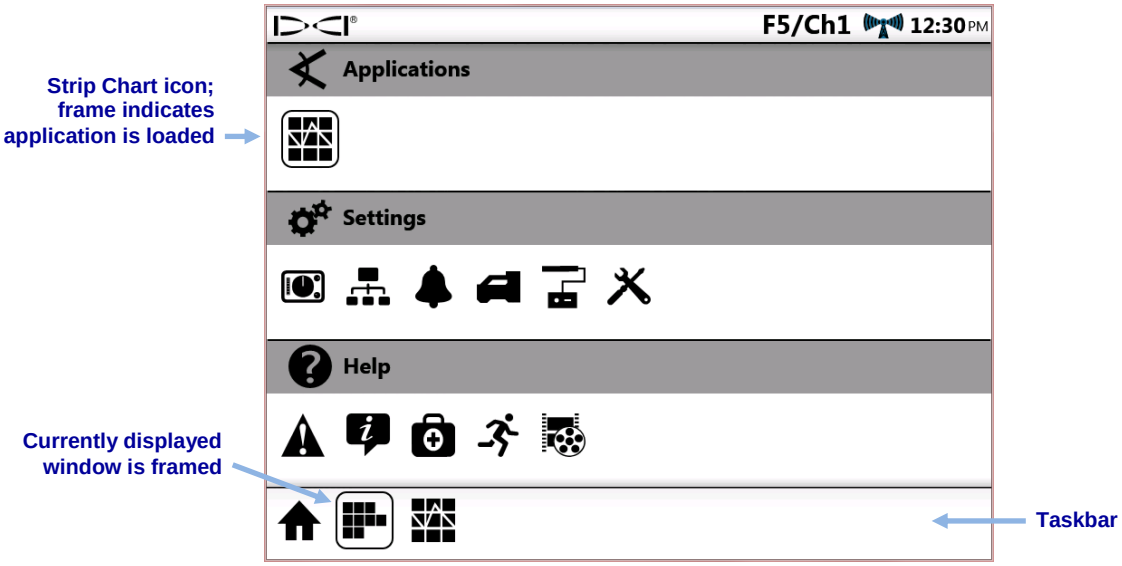
From the Home screen, tap **Main Menu** once. Application icons appear in the top row as shown below; app instructions can be found online at www.DigiTrak.com.



Main Menu, Applications Row

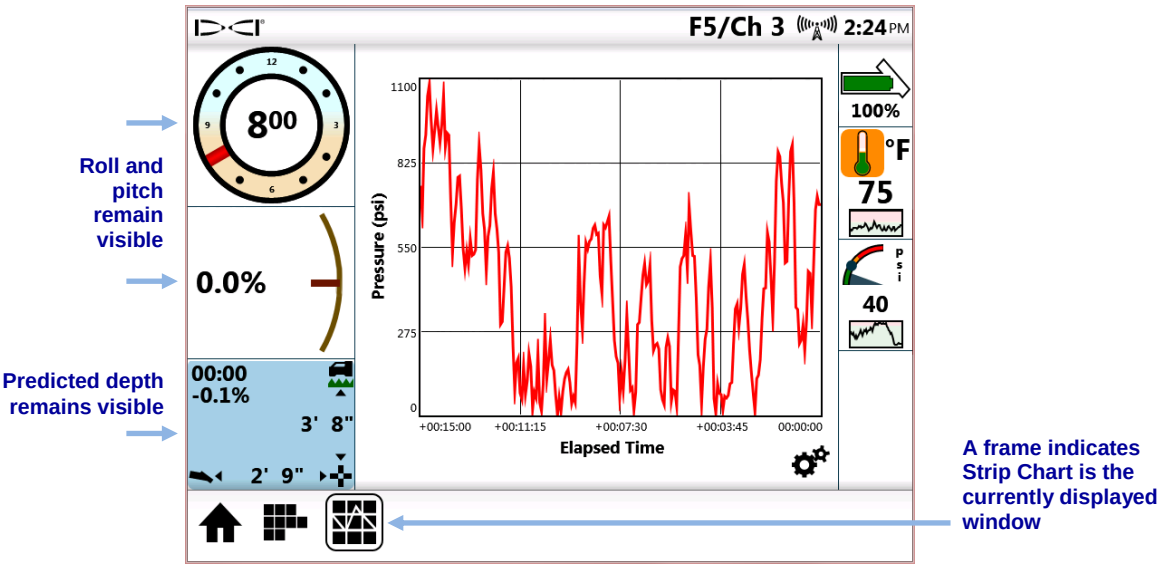
Notice how the Main Menu icon in the taskbar below now has a frame around it. The frame shows which application or screen is currently displayed.

To start an application, tap the icon to place it in the taskbar. For example, tap the pre-installed **Strip Chart** application icon.



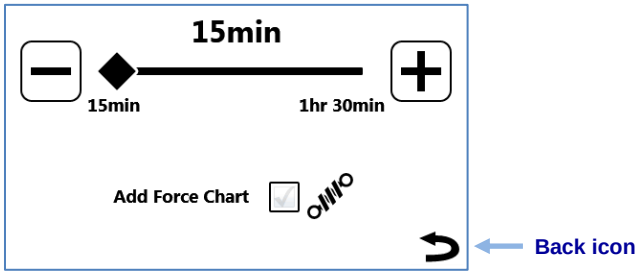
Main Menu with Strip Chart Application Loaded

Aurora frames the **Strip Chart** icon in the Main Menu to indicate the application is now loaded and also places it in the taskbar. Tap **Strip Chart** in the taskbar to open the application. Drilling information from the Home screen such as transmitter roll and pitch, and even predicted depth, minimizes to the left side of the screen as the Strip Chart app appears.



Strip Chart Window

Strip Chart records and graphs fluid pressure data over time[1]. Tap **Settings** on the Strip Chart window to view or change additional options for this window.



Strip Chart Window Options

Options for the Strip Chart window include adding a force chart (with data provided from a TensiTrak® unit) and changing the amount of historical data shown on the graph.

To exit this Settings window, tap **Back** at the bottom of the screen.

To leave Strip Chart running and switch back to the Home screen, tap **Home**.

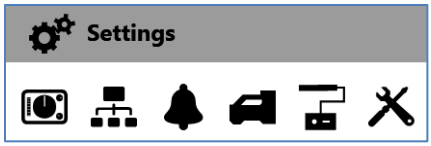
To close the Strip Chart application, tap **Main Menu** and then the framed **Strip Chart** icon in the Applications section. The icon becomes unframed in the apps list and is removed from the taskbar.

[1] Requires a fluid pressure transmitter (FPT).

Settings

From the Home screen, tap **Main Menu** once. Settings icons appear in the middle row. All system setup begins at this menu.

Aurora requires a minimal amount of configuration to work with your particular DigiTrak receiver (locator). At minimum, set the receiver type, telemetry channel, and region (see Receiver on page 19).



Main Menu, Settings Row

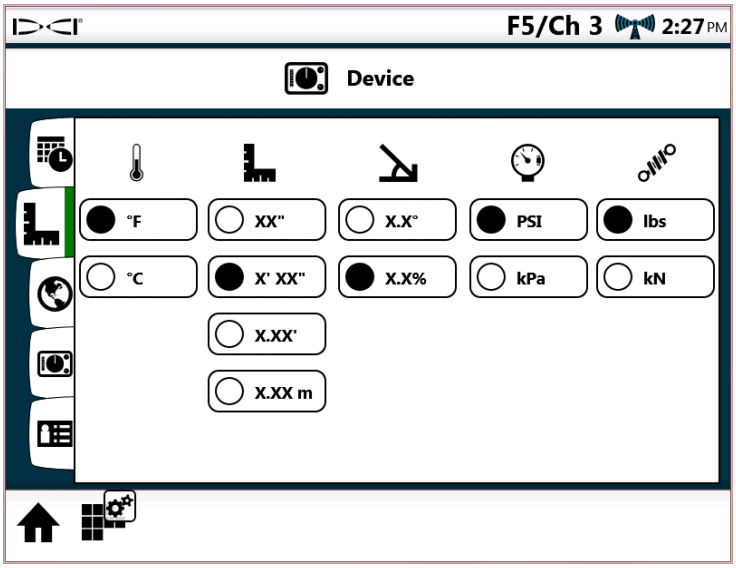
		page			page
	Device	15		Receiver	19
	Network	15		Peripherals	20
	Alarms	18		Update	21

To exit each Settings window described in the following sections, tap **Main Menu** in the Taskbar.

Device

Under **Settings**, tap **Device** and select from the tabs on the left to set the following:

- Date, time, and time zone
- Units: temperature, distance, angle, pressure, and force (shown below)
- Language
- Screen brightness and speaker volume
- Profiles



Settings, Device – Units

Once you have your Aurora set just the way you like it, use **Profiles** to save your own personal profile. Or, set different profiles for typical drilling jobs.

Aurora has preset profiles for each of its onboard languages; select your language profile to quickly set Aurora for your region, language, and units of measure. Note that selecting one of these presets will also return alarm settings to default values.

Save

Save As

Load

Delete

Menu shortcut Tap and hold the **TIME** (2:27 PM above) on the Home screen.

Network

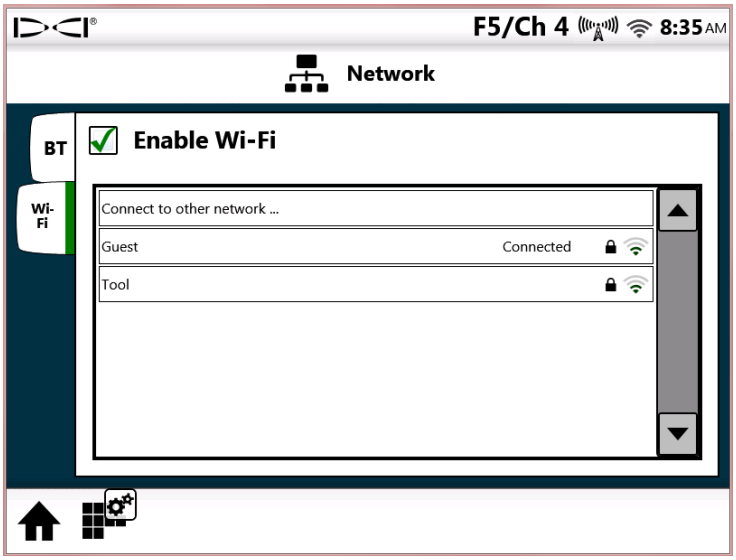
Under **Settings**, tap **Network** and select from the tabs on the left to enable and connect with the following:

- Wi-Fi
- Bluetooth (BT)

Wi-Fi

Use Wi-Fi to download updates and new applications.

To turn Wi-Fi on, select **Enable Wi-Fi**.



Network Settings – Wi-Fi

Select a listed Wi-Fi network from the table and follow on-screen prompts as necessary to connect. Aurora remembers passwords for networks it has connected to previously.

To connect to a known network that is not publically broadcast, tap **Connect to other network…** and follow the onscreen prompts.

When Aurora powers on, it will automatically attempt to reestablish Wi-Fi connections that were enabled the last time it was on. To disconnect, tap a **Connected** network, then tap **OK**. To turn Wi-Fi completely off, clear the **Enable Wi-Fi** checkbox.

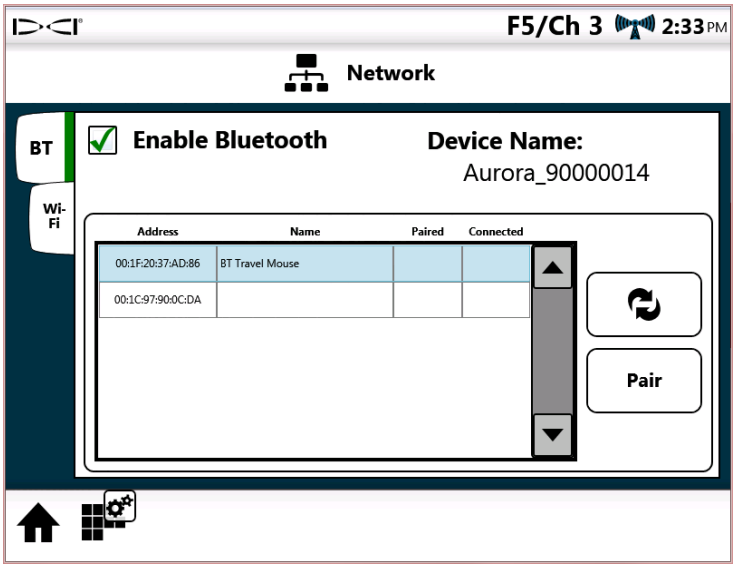
Aurora is compatible with the mobile "hot spot" feature provided by many smart phones. If you are unsure if this feature is available on your phone, how to use it, or what additional cost its use may incur, contact your mobile phone service provider.

Aurora Wi-Fi is not compatible with public networks that require an “I Agree” terms of service acknowledgement typically made in a web browser (known as a captive portal). Compatible networks must be open or only require a password.

Bluetooth

Use Bluetooth to connect a wireless mouse or similar input device.

To turn Bluetooth on, select **Enable Bluetooth**.



Network Settings – Bluetooth

Tap **Refresh** to search for available Bluetooth Human Interface Device (HID) devices.

To connect with a device, select it from the table of compatible interface devices, then tap **Pair**. If the device requests a passcode, consult your device's user manual, or try the common 0000 or 1234. Aurora remembers passcodes for devices it has connected to previously.

When Aurora powers on, it will automatically attempt to reestablish Bluetooth connections that were enabled the last time it was on.

To disconnect a Bluetooth device, select it from the table and tap **Forget** on the pop-up window (this will require re-pairing to reconnect later). To turn Bluetooth completely off, clear the **Enable Bluetooth** checkbox.

Alarms

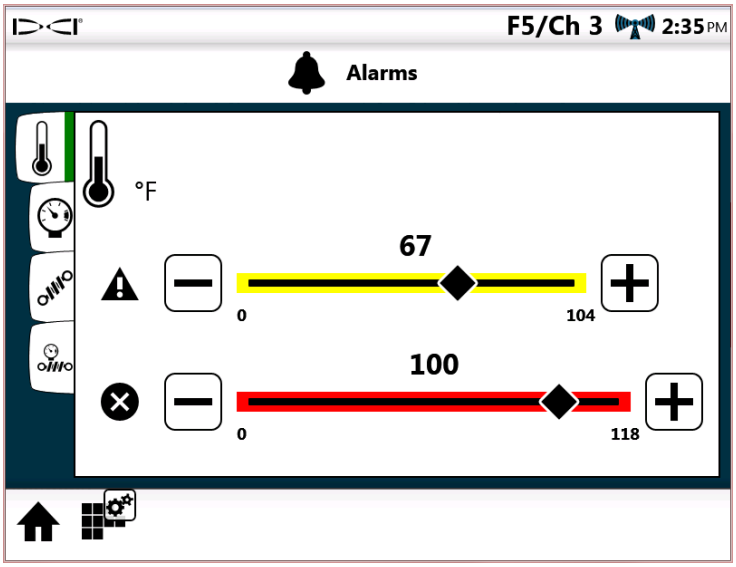
Under **Settings**, tap **Alarms** and select from the tabs on the left to set warning and critical levels for temperature and pressure alarms. Excessive temperatures and pressures typically indicate drilling problems that should be resolved immediately to avoid damage to equipment and/or infrastructure. These settings will activate visual and audible warnings if the levels you set are reached.

- Transmitter temperature (shown below)
- Transmitter fluid pressure[1]
- TensiTrak® Pullback tension[2]
- TensiTrak Pullback fluid pressure[2]

Warning levels are marked yellow, critical levels are marked red. Aurora comes preset with suggested alarm settings. Tap the plus and minus keys or drag the slider control to change alarm settings. To turn an alarm off, set the slider to zero.

Temperature alarms have maximum warning (yellow) and critical (red) levels of 104° F (40° C) and 118° F (48° C), respectively.

Pressure alarms have maximum warning and critical levels of 250 psi (1724 kPa). Pressure exceeding the overload condition of 250 psi will display on the Home screen as **+OL**.



Alarm Settings

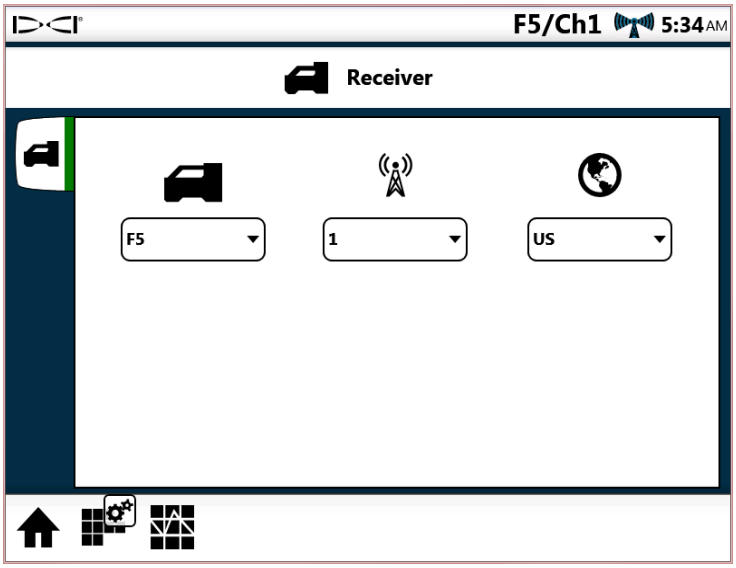
Menu shortcut Tap and hold the temperature °F or pressure psi readings on the Home screen.

[1] Requires a fluid pressure transmitter (FPT).
[2] Requires a TensiTrak pullback and pressure monitoring device.

Receiver

Under **Settings**, tap **Receiver** to set the following:

Receiver model	Select your model of receiver.
Telemetry channel	Choose the channel that minimizes interference; this will change from job site to job site. More bars in the telemetry signal strength icon means a stronger reception. The telemetry channel settings on Aurora and your receiver must match.
Region	Select the region of operation; your receiver must be factory-set for use in the same region.



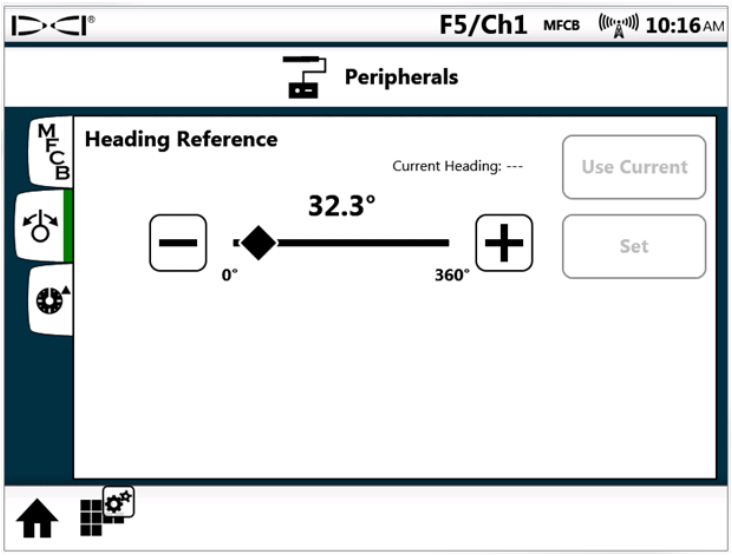
Receiver Settings

Menu shortcut Tap and hold the receiver/telemetry label F5/Ch1 on the Home screen.

Peripherals

Under **Settings**, tap **Peripherals** to set the following:

- Enable or disable a Multi-Function Cable Box (MFCB) used for cable and SST transmitters
- Set Steering Tool (SST) heading reference (shown below)
- Set cable transmitter roll offset



Peripherals Settings

For detailed information on using the MFCB or Steering Tool (SST) transmitter, see the appropriate operator's manual, available at www.DigiTrak.com.

Menu shortcut For MFCB, tap and hold **MFCB** in the Status bar.

Menu shortcut For SST Heading Reference, tap and hold the heading reference **74.8°** (example) on the Home screen (see Using a Steering Tool Transmitter (SST) on page 36).

Menu shortcut For cable transmitter roll offset, tap and hold the roll indicator on the Home screen.

Notice This roll offset tab is for a *cable* transmitter only; when roll offset is enabled on the receiver for a standard transmitter, it will display on Aurora automatically. See Roll Offset on page 25.

Update

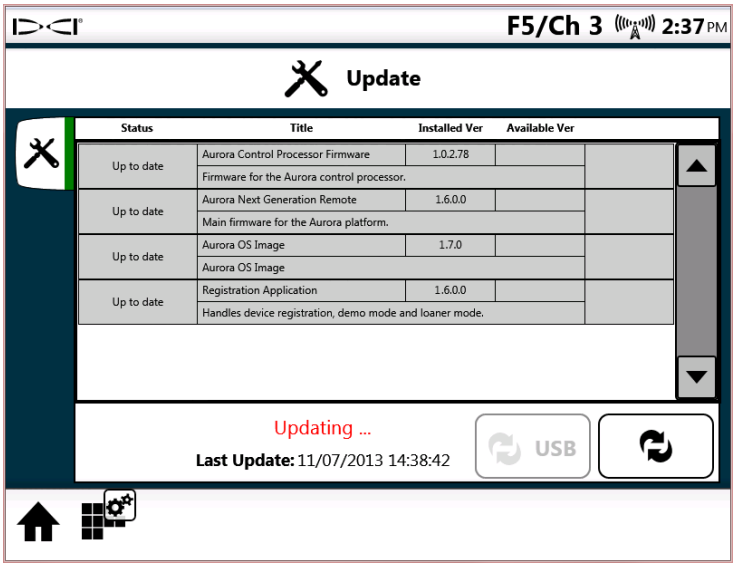
Under **Settings**, tap **Update** to view and download software updates to your system and applications. Updated applications are shaded grey.

To Update Your Aurora

To check for updates over a wireless network, tap **Refresh**[1].

If a DCI representative has provided updates on a USB flash drive, insert the drive in the USB port and tap **USB** to view available updates .

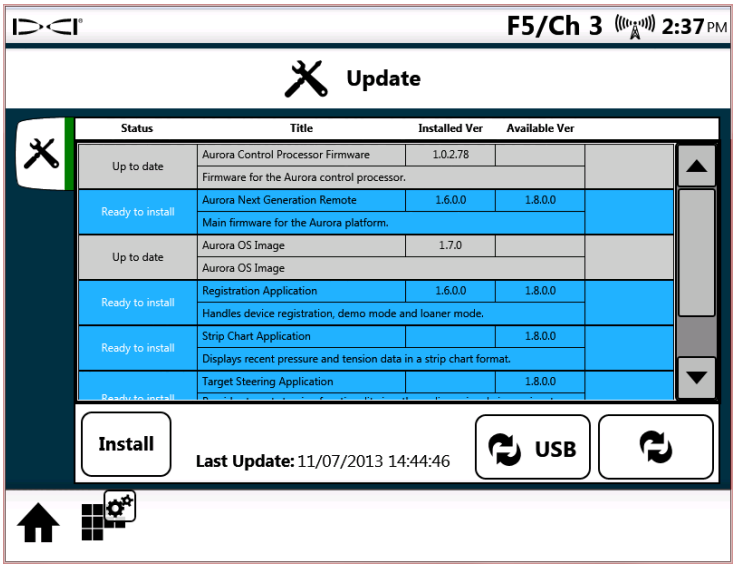
Aurora displays **Updating…** as it searches for updates.



Update Screen – In Progress

[1] **Refresh** requires a wireless connection to the Internet; see Network on page 14.

After Aurora searches the flash drive or remote location, it displays available updates shaded in blue. To install all available updates, tap **Install** (updates cannot be selected or installed individually). To cancel the update, tap **Home** or **Main Menu** to exit.



Update Screen – Updates Available

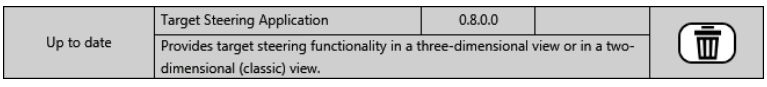
Aurora displays a final confirmation message. Note that the mention of a "reset" does not mean the Aurora will reset to factory defaults, only that it will restart after installation of the updates. Tap **OK** to install the update(s), or **Cancel** to discontinue.

Update Confirmation Screen

When the system returns to the Home screen, updating is complete.

To Delete an Application

To delete an existing application (perhaps to increase available memory), tap **Delete** in the appropriate row.


Up to date
Target Steering Application
0.8.0.0
Provides target steering functionality in a three-dimensional view or in a two-dimensional (classic) view.

Application with Delete Icon

Help

From the Home screen, tap **Main Menu** once. Help icons appear in the bottom row.

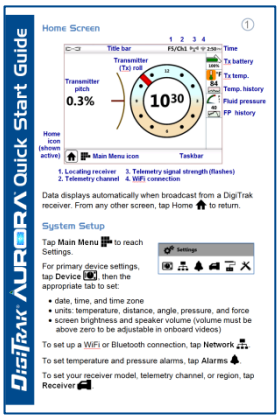
Main Menu, Help Row

Safety Warnings provides important information on the cautions and responsibilities associated with horizontal directional drilling.

Information provides detailed version information on Aurora's software and firmware, as well as contact information for DCI Customer Service.

Power On Self-Tests describes tests Aurora completed when powering up. This is helpful for troubleshooting a particular component that may not be properly connected, powered on, or enabled.

Help displays an onscreen version of the Quick Start Guide (QSG) that was included with your Aurora. The QSG provides the basic information you need to know about operating your Aurora.



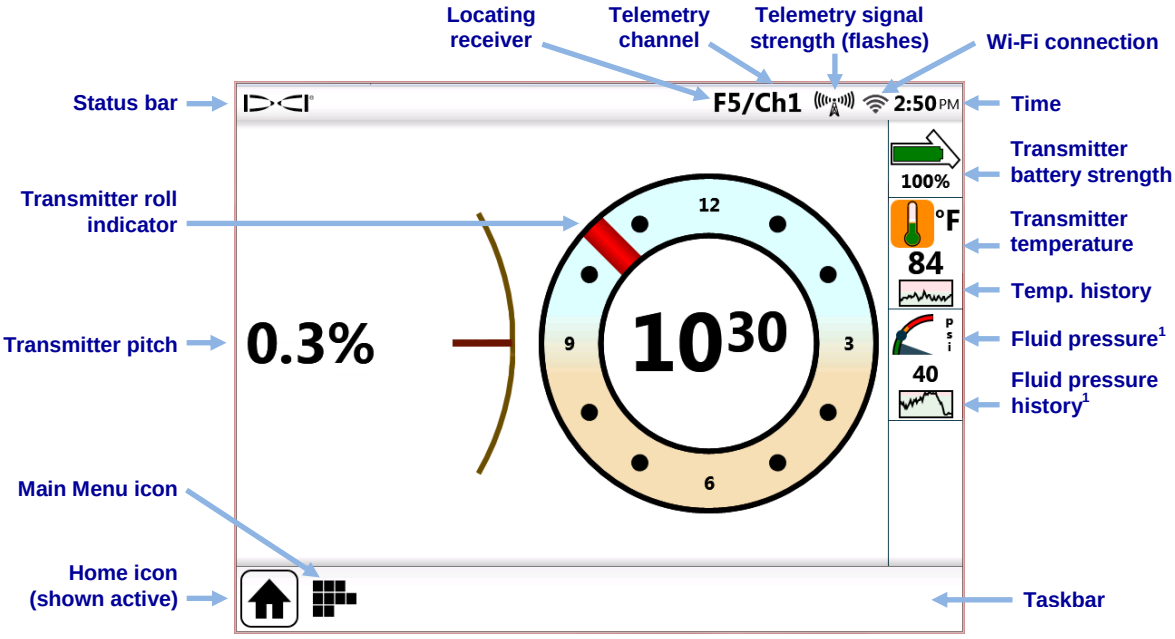
Instructional Videos lets you watch tutorials on topics such as using TensiTrak, off-track locating, and setting up an F5 system. These videos are also available on DCI's YouTube channel at www.youtube.com/dcikent. All telemetry is disabled while the video player is running.

Notice If the master volume setting on the Device window (see page 15) is zero, all video volume will be muted, regardless of the video volume slider setting.

Danger Do not view training videos or help files on Aurora while drilling.

Locating with the Home Screen

The Home screen appears automatically when Aurora powers on. It shows all the information needed for drilling, such as transmitter pitch and roll, telemetry channel, and Target Steering data (when active).



Home Screen – Locating

Data displays on the Home screen as soon as the locating receiver, such as the F5, receives data from a transmitter.

This sample screen also shows a high temperature caution for the drill operator. Pressure data only displays when drilling with a fluid pressure transmitter (FPT).

Telemetry Signal Strength

The number of bars in the telemetry signal strength icon indicates the strength of signal reception from the receiver. If the receiver is far away from the Aurora, fewer signal bars may display on the icon.

A grey icon indicates no reception from a receiver, and all transmitter information will disappear (a cable transmitter will only lose depth). A steady black icon indicates Aurora is connected to a receiver that is not sending data. A flashing blue background behind the icon indicates Aurora is receiving new data from the receiver.

[1] Requires a fluid pressure transmitter (FPT).

If Aurora is not showing telemetry data, check the following:

- Is the receiver showing transmitter telemetry data?
- Does the transmitter have batteries correctly installed?
- Has the transmitter gone to sleep due to inactivity?
- If using a dual-frequency transmitter, is the receiver set to the correct frequency?
- Are the receiver and Aurora set to the same telemetry channel?

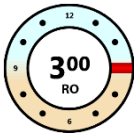
Roll Offset

Roll offset (RO) is an electronic compensation to match the transmitter's 12 o'clock position to the drill head's 12 o'clock position.

Roll offset enabled on the receiver for a standard transmitter will display on Aurora automatically.

To enable roll offset for a cable transmitter, select **Settings**, **Peripherals**, and the **Roll Offset** tab (shortcut: touch and hold the roll indicator).

The letters **RO** on Aurora's roll indicator indicate when it is compensating for roll offset.



Temperature

All DigiTrak transmitters, including TensiTrak®, are equipped with an internal digital thermometer. Drill head temperatures typically range from 64 to 104° F (18 to 40° C) during drilling. The temperature icon on the Home screen will flash orange slowly when the temperature reaches the warning level and flash red quickly when it reaches the critical level. These warnings are accompanied by audible beeps. Suspend drilling when drill head temperature exceeds 118° F (48° C) to permit cooling.

Normal

Warning

Critical

Because the digital thermometer is inside the transmitter, temperature increases due to external drilling conditions will take time to transfer to the transmitter and then the thermometer. Resolve increases in temperature quickly to avoid irreversible damage.

History

Warning and critical values are user-defined as specified on the Alarms screen (see page 18).

The Temperature History graph below the temperature value shows a graph of the last four minutes of temperature readings. Use this history to determine if temperature is trending up or down.

Fluid Pressure Transmitter

Using a fluid pressure transmitter (FPT) or TensiTrak will show instantaneous fluid pressure on the right side of the screen. The pressure icon on the Home screen will flash yellow slowly when the pressure reaches the warning level and flash red quickly when it reaches the critical level. These warnings are accompanied by audible beeps. A blue ball on the gauge marks the maximum recorded pressure; it resets when Aurora restarts.

Normal

Warning

Critical

History

Pressure exceeding the overload condition of 250 psi (1725 kPa) will display as **+OL**.

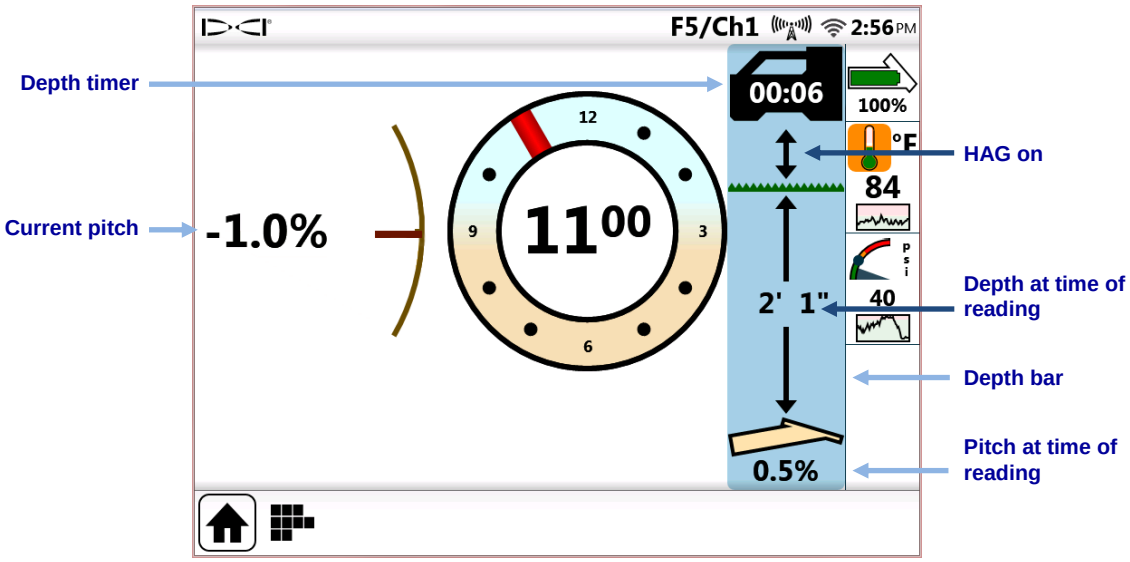
Warning and critical values are user-defined as specified on the Alarms screen (see page 18).

The Fluid Pressure History graph below the pressure value shows a graph of the last four minutes of fluid pressure readings. Use this history to determine if pressure is trending up or down.

If you are not using an FPT or TensiTrak transmitter, pressure data will not display.

Depth Readings

When the receiver takes a depth reading at the locate line (LL), Aurora adds the blue Depth Bar, which provides transmitter depth and pitch information beside the roll indicator:



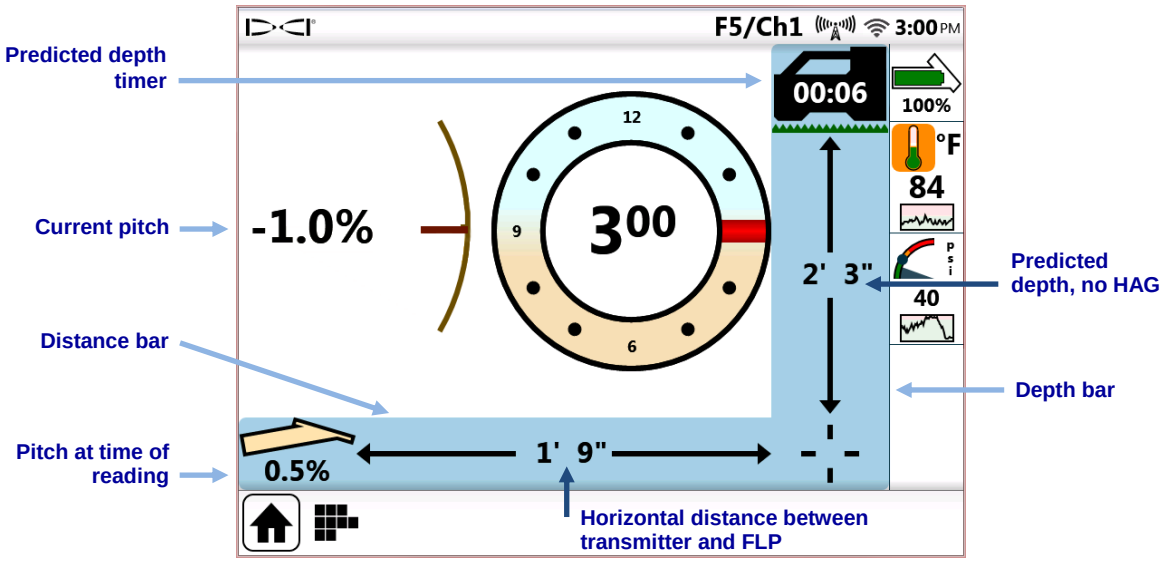
Home Screen – Depth Reading

The blue highlighting remains for ten seconds to indicate the information is recent. After ten seconds the blue reverts to white, but the depth bar data remains for five minutes, which is counted by the depth timer located in the receiver icon. A new depth reading from the receiver will redraw the depth bar blue and restart the depth timer.

The Depth bar will also reflect if Height-Above-Ground (HAG) is set on the receiver. In the above image, the arrow between the receiver and ground level indicates HAG is on.

Predicted Depth

The predicted depth display appears when the receiver takes a depth reading at the front locate point (FLP). The predicted depth screen shows arrows pointing to the receiver and the predicted depth point ahead of the transmitter.



Home Screen – Predicted Depth Reading

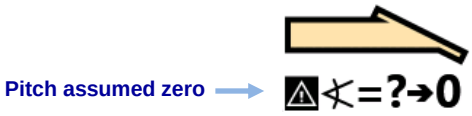
Notice A depth reading taken at the rear locate point (RLP) will still cause the predicted depth to display, since the receiver does not distinguish between the FLP and RLP, however, the data will be inaccurate.

When the receiver takes a predicted depth reading at the FLP, the screen adds the blue Depth and Distance Bars, which provides transmitter pitch and predicted depth and distance information beside and below the roll indicator.

The blue highlighting remains for ten seconds to indicate the information is recent. After ten seconds the blue reverts to white, but the depth and predicted distance bars remain for five minutes, which is counted by the predicted depth timer located in the receiver icon. A new predicted depth reading from the receiver will redraw the predicted Depth and Distance Bars blue and restart the predicted depth timer.

The Depth bar will also reflect if Height-Above-Ground (HAG) is set on the receiver. In the above image, HAG is off.

When transmitter pitch is unavailable at the receiver due to range restrictions or interference, Aurora will assume the transmitter has a pitch of zero for depth and predicted depth readings. In this case, it will display Pitch Assumed Zero beneath the transmitter icon.



Transmitter Pitch Unavailable

If the drilling angle prior to loss of pitch was at or near zero, a predicted depth reading can still be fairly accurate. If the last known pitch was not near zero, the predicted depth calculation will not be accurate. In either case, the predicted depth calculation will become increasingly inaccurate with each rod drilled with no pitch data.

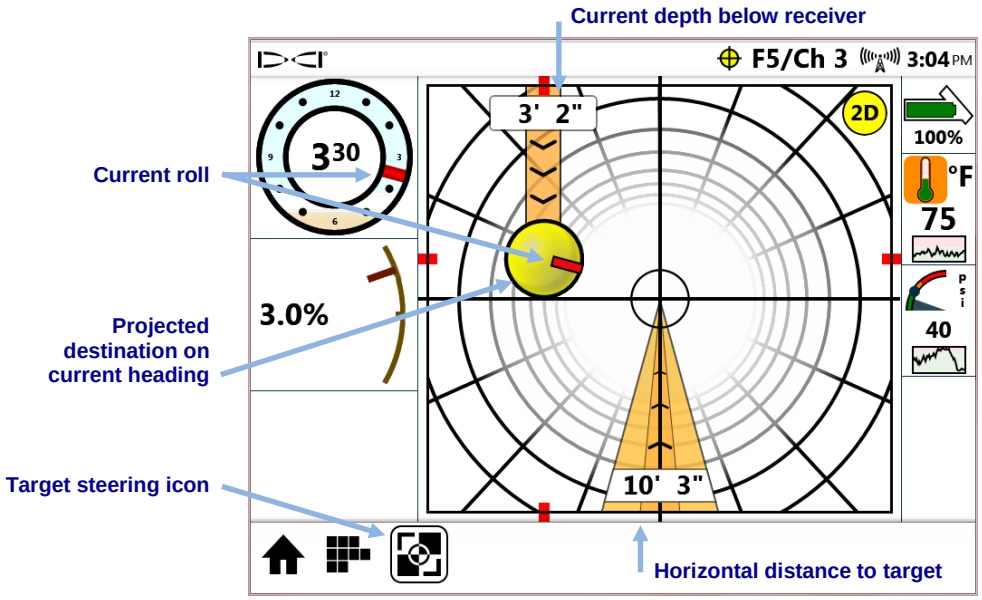
The safest course of action is to stop drilling until pitch data is restored. Options available to the receiver operator to increase signal reception between the transmitter and receiver include changing the transmitter frequency (if compatible) and off-track locating to avoid interference.

Target Steering

Consult your locating system operator's manual for information on determining when Target Steering is practical and how to start it on the receiver.

Steering to the Target

Once the target depth has been entered on the receiver, Aurora automatically displays the Target Steering screen. Aurora displays the flashing target steering icon in the Status bar as long as it is receiving target steering information. To hide the Target Steering screen, tap **Home**.



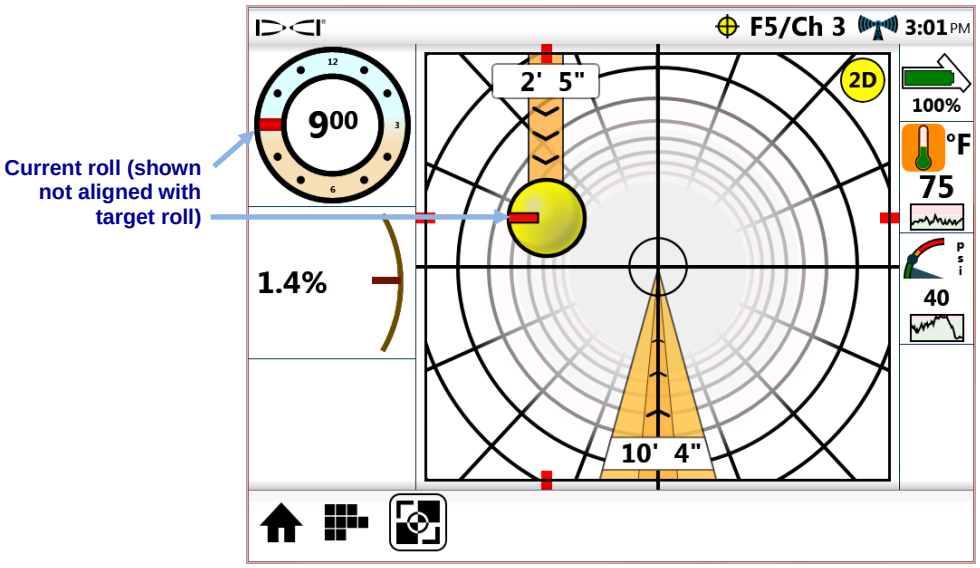
Target Steering Screen, Steering Toward Target

The target in the center of the image above represents the target depth entered in the receiver for a point directly below it. The yellow ball represents the projected destination or "aim point" of the drill head in relation to the target. In this case, the drill head is *currently* estimated at 3' 2" (1.0 m) below the plane of the receiver, and the target is 10' 3" (3.1 m) ahead.

This target steering scenario estimates that on the current heading, with no further steering corrections, the drill head will arrive above and to the left of the target under the receiver.

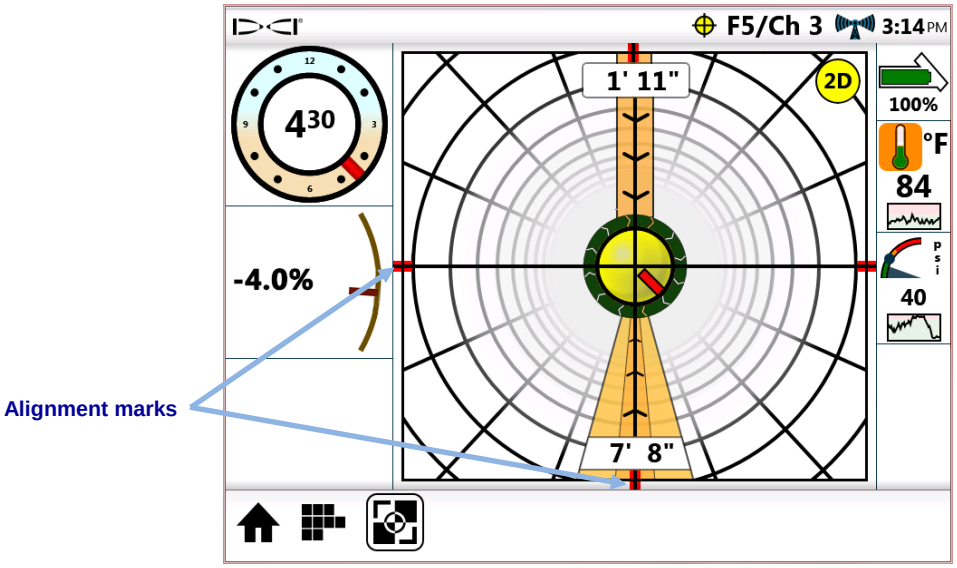
The rectangular indicator inside the target ball indicates the current roll position of the drill head, and mimics the roll indicator. When the indicator points toward the target, the drill head is correctly positioned to steer closer to the intended bore path. Steer the yellow ball onto the target.

The example below shows the drill head roll at almost the exact opposite (9:00 o'clock) of what is needed to reach the target (4:00 o'clock).



Target Steering Screen, Steering Away From Target

With correct steering, the target ball reaches the center of the display and is surrounded by a green ring. At this point, the drill is correctly heading to the programmed target location.

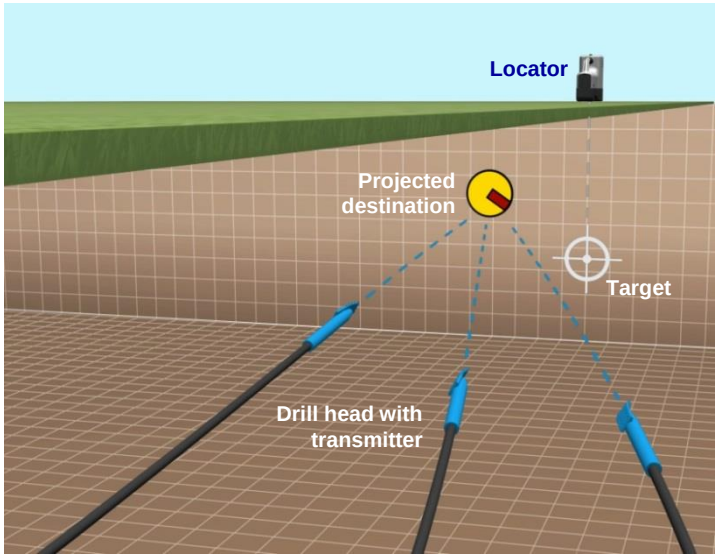


Target Steering Screen, Drill Head Aligned On Bore Path

The preceding target steering screen shows the drill head correctly aligned to reach the target at 7' 8" (2.3 m) ahead, and the drill head is *currently* 1' 11" (0.6 m) below the plane of the receiver. The red alignment marks help show when the drill head is perfectly aligned with the target.

Understanding the Ball

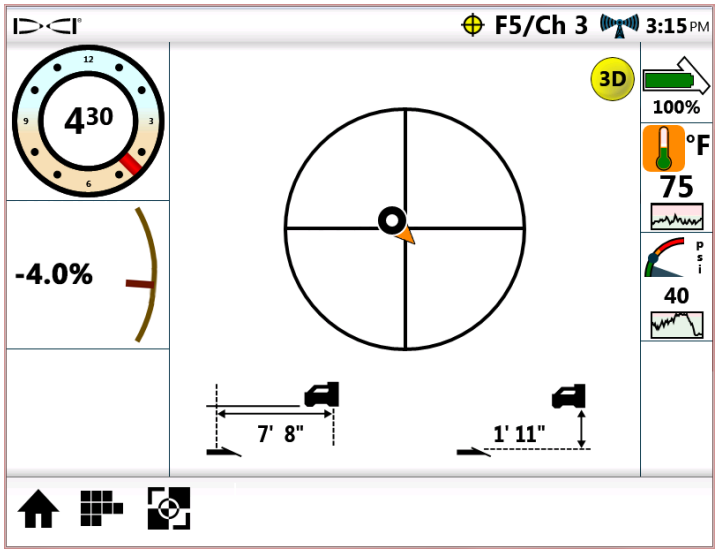
As noted in the diagram below, the yellow projected destination ball being to the left of the target does not necessarily mean the drill head is also currently to the left of the target. However, the required steering corrections remain the same: right and down.



Target Steering: Sample Drill Head Locations

Classic View

In addition to the three-dimensional target steering screen, Aurora can also display the classic two-dimensional target steering view from previous versions of DigiTrak remote displays. Tap either 2D or 3D at the upper right of the screen to switch to 2D or 3D views at any time.



Target Steering, Classic Two-Dimensional View

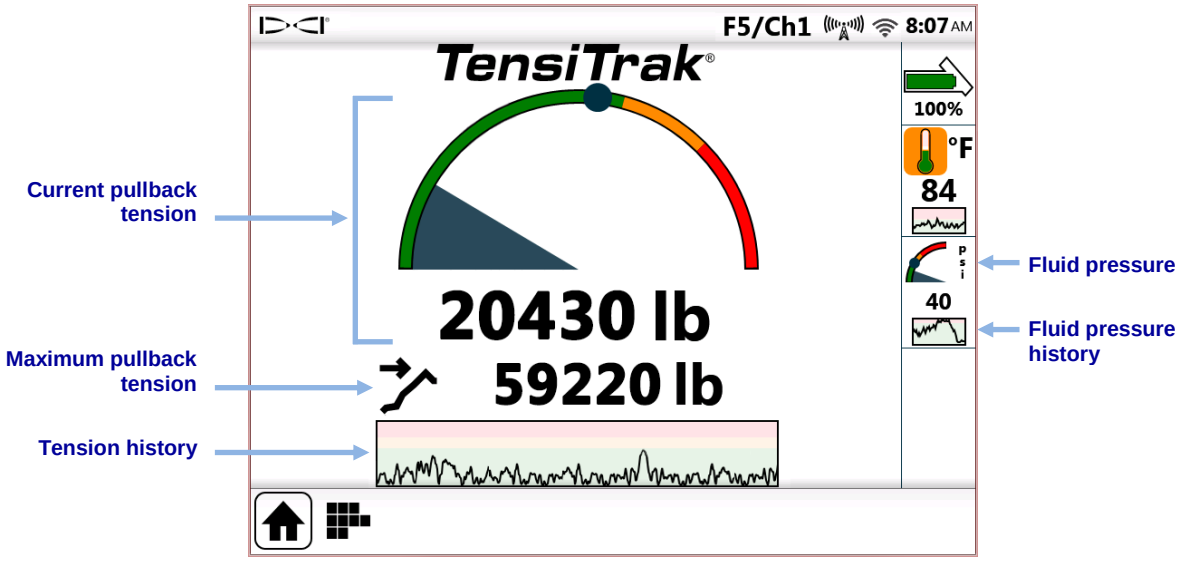
Turning Target Steering Off

The flashing Target Steering icon in the Status bar indicates when Target Steering data is being received. It displays even if you are on a different screen. If you are viewing the target steering screen when Aurora stops receiving target steering information from the receiver, the display will stop showing data.

Until Aurora is powered off, the target steering app remains loaded so if target steering data resumes, Aurora will continue processing it without interrupting your current task.

Working with TensiTrak

When Aurora detects tension data provided by a TensiTrak® pullback and pressure monitoring system, it automatically displays the TensiTrak tension gauge.



TensiTrak Gauge

A TensiTrak system provides both product pullback tension and mud pressure. The maximum recorded tension (in this case, **59220 lb**) also displays on the gauge as a blue circle.

The history graph displays about 30 minutes of historical data; new data plots on the right, pushing older data to the left.

For details on working with TensiTrak, please refer to the operator's manual, available at www.DigiTrak.com.

Setting Warning Levels

To set TensiTrak tension or fluid pressure caution and warning levels, go to the **Main Menu** and in the **Settings** section, tap **Alarms**, then select either the **TensiTrak Pullback Tension** or **TensiTrak Pullback Fluid Pressure** tab.

Menu shortcut For tension alarms, tap and hold the pullback tension gauge.

Menu shortcut For fluid pressure alarms, tap and hold the fluid pressure gauge.

Working with the MFCB

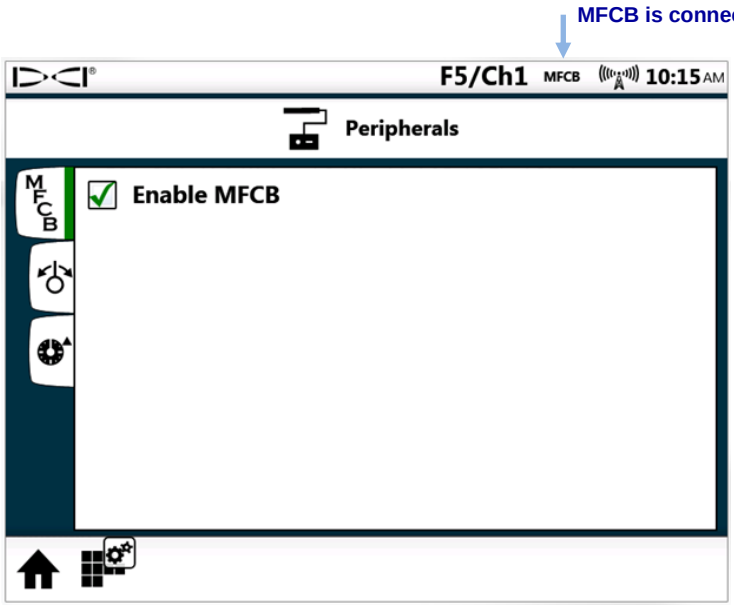
For instructions on making the power and data connections between the Multi-Function Cable Box (MFCB) and Aurora, please read the MFCB Operators' Manual, available at www.DigiTrak.com.

Enabling the MFCB

Until you have made the proper power and data connections between the MFCB and Aurora, the checkbox to **Enable MFCB** on the **MFCB** tab of the **Peripherals** screen (shown below) will be grayed out as unavailable.

Once the MFCB is properly connected to Aurora, an **MFCB** icon displays in the Status bar. If the MFCB appears as disabled MFCB, enable it as follows:

1. Tap **Main Menu**, then tap **Peripherals**.
2. Tap the **MFCB** tab (shown below).
3. Tap the checkbox to **Enable MFCB**. This selection will remain in effect even after a power cycle.
4. Tap to return to the Home screen.

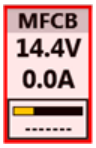


Enabling MFCB on the Peripherals Screen

Menu shortcut Tap and hold **MFCB** in the Status bar.

Notice To use a standard battery-powered transmitter while the MFCB is connected, simply clear the **Enable MFCB** checkbox. Aurora will now receive drilling data from the receiver (locator).

After the MFCB is correctly connected and enabled, Aurora replaces the transmitter battery icon at the top right of the screen with a display of the voltage and amps at both the MFCB and transmitter. This new portion of the screen functions as an on/off button for using the MFCB. Upon first use after Aurora is turned on, this MFCB button will be bordered and shaded in red, indicating the MFCB is not yet sending power to the transmitter.



Using a Cable Transmitter

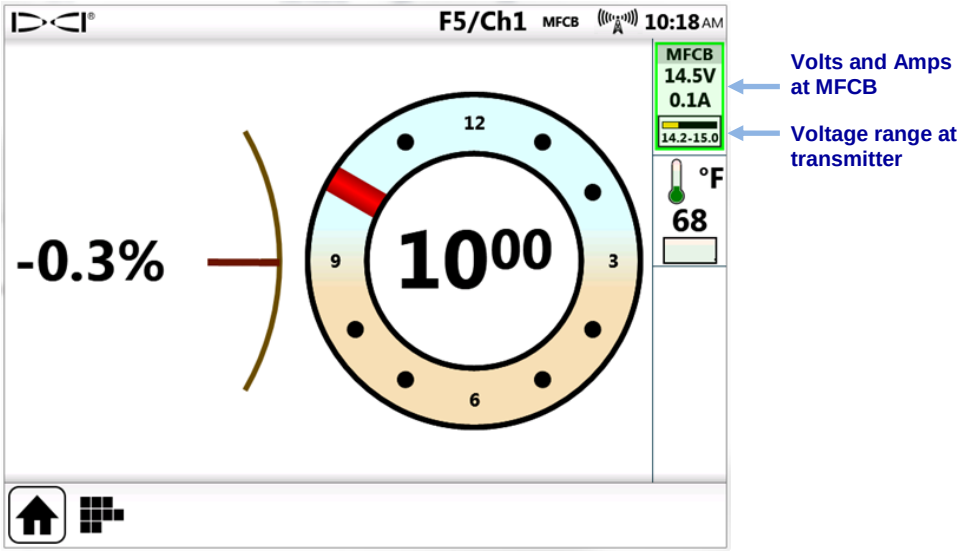
Connect and enable the MFCB as described in the previous section.

Applying Power to the Transmitter

To send power to the transmitter, tap the red button; it turns green to indicate the transmitter is now powered, and current voltage and amperage information displays along with other transmitter data such as roll and pitch.

In this example for a cable transmitter, the MFCB is supplying 14.5 V and 0.1 A of power at the box, and the transmitter is receiving a voltage in the range of 14.2–15.0 V.

Other information displayed on the Home screen is the same as when using a standard battery-powered transmitter.



Home Screen with MFCB Power Readings

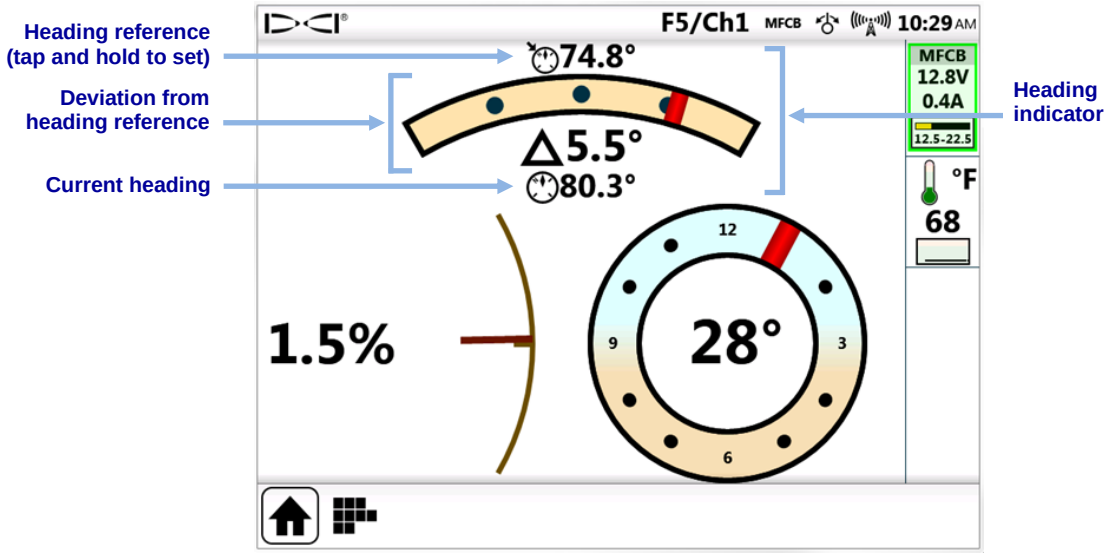
Monitor the voltage at the transmitter closely, since the length of cable or quality of connections may cause the voltage to drop below the level necessary for the cable transmitter to function.

Using a Steering Tool Transmitter (SST)

For instructions on using the Steering Tool transmitter, please read the SST Operator's Manual, available at www.DigiTrak.com.

Connect and, if necessary, enable the MFCB as described in Enabling the MFCB on page 34.

When Aurora detects that a steering tool is connected to the MFCB, it adds a heading indicator to the display.



Home Screen with SST Heading Indicator and MFCB Power Readings

As shown in the above image, roll accuracy for SST changes from a 24-position to a much more accurate 360° indicator.

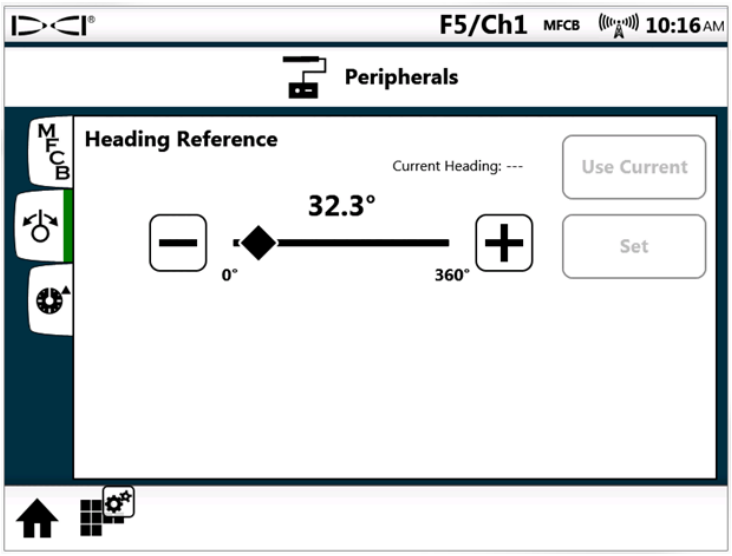
Setting a Heading Reference

To set the desired heading reference:

1. Tap **Main Menu**, then tap **Peripherals**.
2. Tap the **Heading Reference** tab (shown below).
3. Use the +/- slider controls to select the desired heading reference.
4. Tap **Set** to set the heading reference and return to the Home screen.

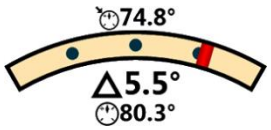
The **Set** button is unavailable until the heading reference changes.

If Aurora is detecting a valid heading from the SST, this value will display beside **Current Heading:** and the **Use Current** button will be available. In this case, you can tap **Use Current** to set this value as the heading reference.



SST Heading Reference Screen

Menu shortcut Tap and hold the heading indicator on the Home screen.



Heading Indicator

Appendix A: System Specifications

Power Requirements

Device	Operational Voltage	Operational Current
DigiTrak Aurora AF10 Display	10–28 V ⎓ (nominal)	2.10 A max
DigiTrak Aurora AP8 Display		1.75 A max

Environmental

DigiTrak Aurora AF10 and AP8 Displays:

Relative humidity	<90%
Operating temperature	-4 to 140° F (-20 to 60° C)
Dust and water ingress	IP66
Handling drop (1 meter)	IEC 61010-1
Vibration	SAE J1455
Electromagnetic interference	EN 55024/CISPR24, IEC 61000-4-3,4,6,8
Electromagnetic compatibility	EN 55022/CISPR22 (Class B)
Electrostatic discharge	IEC 61000-4-2

DIGITAL CONTROL INCORPORATED

19625 62nd Ave S, Suite B103
Kent Washington 98032, USA
425.251.0559 / 800.288.3610
dci@digital-control.com, www.DigiTrak.com

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2. After contacting a DCI customer service representative by telephone, the representative will attempt to assist you in troubleshooting while you are using the DCI product during actual field operations. Please have all related equipment available together with a list of all DCI product serial numbers. It is important that field troubleshooting be conducted because many problems do not result from a defective DCI product, but instead are due to either operational errors or adverse conditions occurring in User's drilling environment.
3. If a DCI product problem is confirmed as a result of field troubleshooting discussions with a DCI customer service representative, the representative will issue an RMA number authorizing the return of the DCI product and will provide shipping directions. You will be responsible for all shipping costs, including any insurance. If, after receiving the DCI product and performing diagnostic testing, DCI determines the problem is covered by the Limited Warranty, required repairs and/or adjustments will be made, and a properly functioning DCI product will be promptly shipped to you. If the problem is not covered by the Limited Warranty, you will be informed of the reason and be provided an estimate of repair costs. If you authorize DCI to service or repair the DCI product, the work will be promptly performed and the DCI product will be shipped to you. You will be billed for any costs for testing, repairs and adjustments not covered by the Limited Warranty and for shipping costs. In most cases, repairs are accomplished within 1 to 2 weeks.
4. DCI has a limited supply of loaner equipment available. If loaner equipment is required by you and is available, DCI will attempt to ship loaner equipment to you by overnight delivery for your use while your equipment is being serviced by DCI. DCI will make reasonable efforts to minimize your downtime on warranty claims, limited by circumstances not within DCI's control. If DCI provides you loaner equipment, your equipment must be received by DCI no later than the second business day after your receipt of loaner equipment. You must return the loaner equipment by overnight delivery for receipt by DCI no later than the second business day after your receipt of the repaired DCI product. Any failure to meet these deadlines will result in a rental charge for use of the loaner equipment for each extra day the return of the loaner equipment to DCI is delayed.

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DIGITAL CONTROL INCORPORATED

19625 62nd Ave S, Suite B103
Kent Washington 98032, USA
425.251.0559 / 800.288.3610
dci@digital-control.com, www.DigiTrak.com

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